

ical and mycologic examination revealed absence of infection in 19 of the 20 patients in the miconazole group, 10 of the 20 in the placebo group and 15 of the 20 in the tolnaftate group.

At the 6-week follow-up 19 (95%) of the 20 patients in the miconazole group remained free of infection, whereas only 2 (10%) of the 20 in the placebo group and 13 (65%) of the 20 in the tolnaftate group remained free of infection.

Discussion

Miconazole was effective in clearing dermatophyte infection of the feet in 95% of patients, and there were no recurrences in the following 6 weeks.

The rather surprising initial response to the placebo may be explained by the presence of ethylene glycol esters in the cream base, since ethylene glycol has some antimicrobial activity. The hygienic improvement undoubtedly added to the placebo effect. The high rate of relapse and the continuing presence of fungal elements indicate the temporary nature of this effect.

The inclusion of tolnaftate in the study allowed conclusions as to the relative efficacy of the two agents. As expected, significant ($P < 0.03$) and lasting clinical improvement was seen in the tolnaftate-treated sites as compared with the placebo-treated sites. However, comparison of the results with the two active agents showed a significant difference (P

< 0.05) in favour of miconazole.

Miconazole, as demonstrated by this study, appears to live up to the expectations generated by previous reports¹⁻³ and should prove a very useful agent in the treatment of superficial fungal infections of the skin.

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References

1. SVEJGAARD E: Double-blind trial of miconazole in dermatomycosis. *Acta Derm Venereol (Stockh)* 53: 497, 1973
2. BOTTER AA: Topical treatment of nail and skin infections with miconazole, a new broad-spectrum antimycotic. *Mykosen* 14: 187, 1971
3. MANDY SJ, GARROTT TC: Miconazole treatment for severe dermatophytoses. *JAMA* 230: 72, 1974

Massive aspiration of talcum powder by an infant

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Talcum powder, which contains mostly magnesium silicate, is widely used for the routine care of infants in the home.

At least 24 cases of talcum powder aspiration have been described in the literature.¹⁻⁹ The principal data about these cases and the one we have encountered are summarized in Table I. Most of the children were older than 6 months, and those old enough to play with the container were considered at risk. The mortality was 20%; of the 17 patients treated with steroids 2 died (12%), whereas of the 8 children not treated with steroids 3 (38%) died.

Our case, one of severe pneumonia due to talcum powder aspiration in a 1-month-old infant, the youngest patient we are aware of, is reported below.

Case report

On Sept. 14, 1977 a 1-month-old girl who had been born prematurely was found in her crib in respiratory distress. She was covered with talcum powder, which had been poured into

her mouth and nose and onto her body by her 3-year-old brother.

The baby arrived at a nearby hospital in cardiorespiratory arrest. Resuscitative measures included endotracheal intubation, positive pressure ventilation, intracardiac administration of epinephrine, and intravenous administration of bicarbonate and hydrocortisone. Approximately 40 minutes after these measures were started she began to breathe spontaneously and to move her limbs, and was then transferred to Sainte-Justine Hospital.

At the time of admission to our hospital, 3 hours after the accident, the baby was spontaneously breathing

100% oxygen through an endotracheal tube at a rate of 30/min, and her colour was satisfactory. She was moving all four limbs. Intercostal retractions and numerous wheezes were noted. Talcum powder was present in the nose and mouth. A specimen of arterial blood with the patient breathing 100% oxygen showed that the partial pressure of oxygen was 45 mm Hg, the partial pressure of carbon dioxide 31 mm Hg, the pH 7.12 and the base excess -17 meq/L. The hemoglobin value was 8.4 g/dL and the leukocyte count $27.2 \times 10^9/L$ (including 11% neutrophils and 12% band forms). Roentgenography of the chest demon-

Table I—Details of reported cases of talcum powder aspiration

| Authors | No. of patients | Age | Treatment | Outcome |
|---|-----------------|-----------------|--|--|
| Molnar, Nathenson and Edberg ⁷ | 1 | 22 months | No steroids | Died |
| Jenkins ⁵ | 1 | 14 months | No steroids | Died |
| Hughes and Kalmer ⁴ | 1 | 14 months | Steroids | Survived |
| Cless and Anger ¹ | 1 | 10 months | No steroids | Died |
| Lund and Feldt-Rasmussen ⁶ | 1 | 24 months | Steroids | Survived |
| Gould and Barnardo ² | 1 | 7 years | Steroids | Survived |
| Tortorolo and Romano ⁹ | 3 | 7 months | Steroids | Survived |
| | | 12 months | Steroids | Survived |
| | | 9 months | Steroids | Died |
| Gouvea and colleagues ³ | 13 | 5: < 1 year | Steroids in 8 cases, bronchial washing in 11 | 12 survived; 1 died (with steroid therapy) |
| Pfenninger and D'Apuzzo ⁸ | 2 | 4: 1 to 2 years | Steroids and bronchial washing | Survived |
| | | 4: > 4 years | | |
| | | 7 months | | |
| Brouillette and Weber (present case) | 1 | 13 months | Steroids | Survived |
| | | 1 month | Steroids | Survived |

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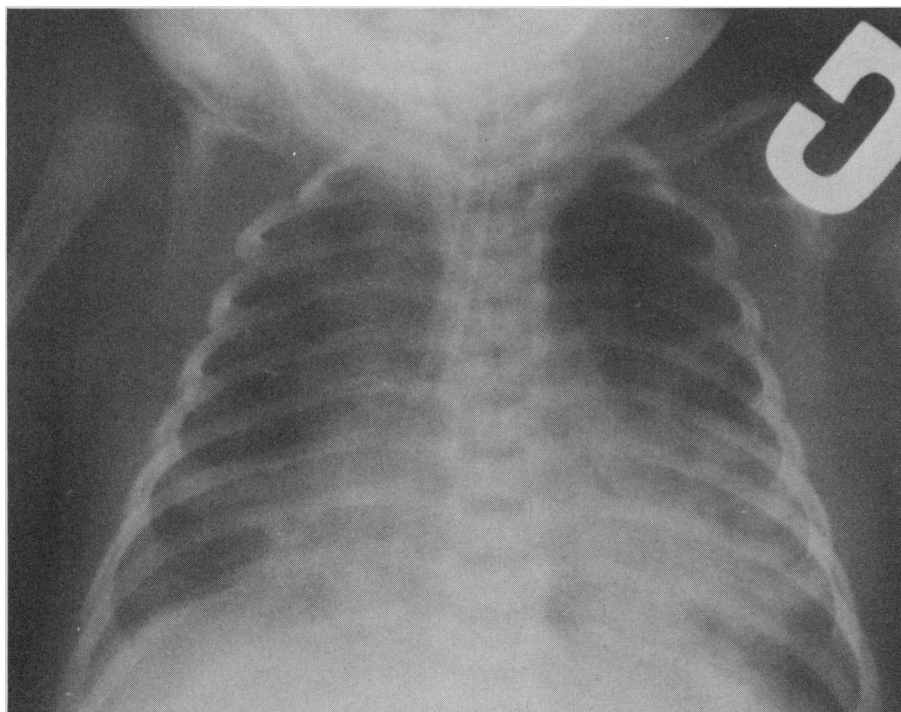


FIG. 1—Bilateral pulmonary infiltrations in 1-month-old infant after aspiration of talcum powder (endotracheal tube has temporarily slipped into right main-stem bronchus).

strated bilateral infiltrations (Fig. 1).

The baby was given mechanical ventilation, oxygen, nafcillin, gentamicin, hydrocortisone and physical therapy to the chest. The alveolar-arterial difference in oxygen tension remained high for 72 hours and then started to decrease. The clinical course was similar to that of severe bronchiolitis. The baby was successfully weaned from the ventilator and the nasotracheal tube was removed 6 days after admission. She was discharged from hospital 6 days later, without any apparent sequelae.

Discussion

Talcum powder is usually not considered harmful by parents and physicians, but in view of the high mortality associated with its aspiration its presence in the home should be regarded as potentially hazardous. Since it is not essential to the routine care of infants its use should be discouraged, or at least parents should be strongly advised not to leave containers within the reach of children, and should be told about the serious and even fatal consequences of its inhalation.

In cases of talcum powder aspiration steroid therapy should probably be given in addition to the usual therapy for respiratory insufficiency. Bronchial washing may also be useful in severe cases, but this is a

potentially dangerous procedure. The authors who have reported the use of this approach have not presented sufficient technical details for an evaluation of its value and dangers.^{3,8}

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References

1. CLESS D, ANGER R: Erstickungstod durch Aspiration von Kinderpuder. *Kinderaerzt Prax* 22: 506, 1954
2. GOULD SR, BARNARDO ED: Respiratory distress after talc inhalation. *Br J Dis Chest* 66: 230, 1972
3. GOUVEA FP, GONSALVES PE, LEBRUN E, et al: Aspiração aguda de talco e outros pós: terapêutica por lavagem brônquica. *Rev Hosp Clin Fac Med Sao Paulo* 21: 49, 1966
4. HUGHES WT, KALMER T: Massive talc aspiration. Successful treatment with dexamethasone. *Am J Dis Child* 111: 653, 1966
5. JENKINS MQ: Poisoning of the month. Dusting powder inhalation. *J SC Med Assoc* 59: 62, 1963
6. LUND JS, FELDT-RASMUSSEN M: Accidental aspiration of talc. Report of a case in a two-year-old child. *Acta Paediatr Scand* 58: 295, 1969
7. MOLNAR JJ, NATHENSON G, EDBERG S: Fatal aspiration of talcum powder by a child. Report of a case. *N Engl J Med* 266: 36, 1962
8. PFENNINGER J, D'APUZZO V: Powder aspiration in children: report of two cases. *Arch Dis Child* 52: 157, 1977
9. TORTOROLO G, ROMANO C: Pneumopatia acuta da inalazione di talco. *Minerva Nipiol* 16: 15, 1966

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